

What is claimed:

1. A method for simulating an appearance of products on an image of a consumer, comprising

- compiling a database of a plurality of products, said database including appearance information for each said product
- acquiring a base image of a consumer, said base image including a plurality of pixels
- identifying a product application area in said base image, said product application area including a blending region, said product application area and said blending region thereof being defined by sets of pixels of said base image
- receiving a product selection from said consumer
- retrieving appearance information associated with said selected product from said database
- modifying appearance information of said pixels of said product application area according to said appearance information of said selected product
- blending said blending region with said base image by modifying appearance information of said pixels of said blending region according to appearance information of said selected product and according to appearance information of associated pixels of said base image in said blending region
- displaying a composite image of said base image as modified and blended in said application area and said blending region thereof
- providing means to display an alternative product within said product application area

2. A method for simulating an appearance of products on an image of a consumer, as in claim 1, further comprising:

- assigning alpha channel values to each pixel of said set of pixels of said product application area,
- blending said product application area with said base image by modifying appearance characteristics of pixels of said product application area according to appearance information of said selected product and according to appearance information of associated pixels of said base image
- in said blending step, weighing said appearance information of said associated pixels of said base image and appearance information of said selected product according to alpha values of associated pixels of said make-up application area.

3. A method for simulating an appearance of products on an image of a consumer, as in claim 2, further comprising:

-in said blending step, weighing said appearance information of said associated pixels of said base image in reverse proportion to appearance information of said selected product.

4. A method for simulating an appearance of products on an image of a consumer, as in claim 3, further comprising:

a red color value (Rc) of said pixels of said product application area in said composite image being determined by the following formula:

$Rc = [Rb * Alpha + Rp * (Alpha - UpperLimit)] / UpperLimit$, where

Rb is a red color value of an associated pixel in said base image

Rp is a red color value of said selected product;

Alpha is an Alpha value of an associated pixel in said product application area;

and

UpperLimit is a predefined upper limit of said Alpha values

a green color value (Gc) of said pixels of said product application area in said composite image being determined by the following formula:

$Gc = [Gb * Alpha + Gp * (Alpha - UpperLimit)] / UpperLimit$, where

Gb is a green color value of an associated pixel in said base image

Gp is a green color value of said selected product;

Alpha is an Alpha value of an associated pixel in said product application area;

and

UpperLimit is a predefined upper limit of said Alpha values; and

a blue color value (Bc) of said pixels of said product application area in said composite image being determined by the following formula:

$Bc = [Bb * Alpha + Bp * (Alpha - UpperLimit)] / UpperLimit$, where

Bb is a blue color value of an associated pixel in said base image

Bp is a blue color value of said selected product;

Alpha is an Alpha value of an associated pixel in said product application area;

and

UpperLimit is a predefined upper limit of said Alpha values

5. A method for simulating an appearance of products on an image of a consumer, as in claim 1, wherein:

said step of modifying appearance characteristics of said pixels of said product application area further comprises

- assigning hue and saturation appearance values of said pixels of said product application area equal to hue and saturation appearance values of said selected product

- assigning intensity appearance values of said pixels of said product application area according to intensity appearance values of a plurality of pixels within said product application area in said base image and according to intensity appearance values of a plurality of pixels outside said product application area.

6. A method for simulating an appearance of products on an image of a consumer, as in claim 5, wherein:

- said step of assigning intensity appearance values of said pixels of said product application area further comprises employing the following formula:

$$I_{out} = A * I_{in} + B$$

Where;

I_{out} is the value of the intensity of a pixel of the equalized area ,

I_{out} can range between Upper and Lower Limits of 255 and 0, respectively,

I_{in} is the value of the intensity of an associated pixel of the product application area of the base image (before equalization),

I_{in} can range between the Upper and Lower Limits,

A is the slope of the function and is computed according to a gaussian distribution function, as follows:

$$A = \exp(-0.5 * (I_{color} - I_{mean})^2 / I_{sdev}^2)$$

Where,

I_{color} is the value of the intensity of the applied product color,

I_{mean} is mean value of the intensities of the pixels in the product application area, and

I_{sdev} is the variance of the intensities of the pixels in the product application area,

B is a constant computed by equating the I_{in} and I_{out} values in the equalization function to I_{mean} and I_{color} , respectively.

7. A method for simulating an appearance of products on an image of a consumer, as in claim 5, wherein:

said step of assigning intensity appearance values of said pixels of said product

application area further comprises assigning intensity appearance values of said pixels of said product application area according to intensity appearance values of substantially all of said pixels in said base image.

8. A method for simulating an appearance of products on an image of a consumer, as in claim 7, wherein:

- said step of assigning intensity appearance values of said pixels of said product application area further comprises employing the following formula:

$$I_{out} = A * I_{in} + B$$

Where;

I_{out} is the value of the intensity of a pixel of the equalized area ,
 I_{out} can range between Upper and Lower Limits of 255 and 0, respectively,

I_{in} is the value of the intensity of an associated pixel of the product application area of the base image (before equalization),
 I_{in} can range between the Upper and Lower Limits,

A is the slope of the function and is computed according to a gaussian distribution function, as follows:

$$A = \exp(-0.5 * (I_{color} - I_{mean})^2 / I_{stdev}^2)$$

Where,

I_{color} is the value of the intensity of the applied product color,

I_{mean} is mean value of the intensities of the pixels in the product application area, and

I_{stdev} is the variance of the intensities of the pixels in the product application area,

B is a constant computed by equating the I_{in} and I_{out} values in the equalization function to I_{mean} and I_{color} , respectively.

9. A method for simulating an appearance of products on an image of a consumer, comprising

- compiling a database of a plurality of products, said database including appearance information for each said product

- acquiring a base image of a consumer, said base image including a plurality of pixels

- identifying a product application area in said base image, said product application area including a blending region, said product application area and said blending region thereof being defined by sets of pixels of said base image

- assigning alpha channel values to each pixel of said set of pixels of said product application area,

- receiving a product selection from said consumer

- retrieving appearance information associated with said selected product from said database

- assigning hue and saturation appearance values of said pixels of said product application area substantially equal to hue and saturation appearance values of said selected product

- assigning intensity appearance values of said pixels of said product application area according to intensity appearance values of a plurality of pixels within said product application area in said base image and according to intensity appearance values of substantially all of said pixels of said base image

- said intensity are assigned according to a predetermined algorithm, comprising employing the following formula:

$$I_{out} = A * I_m + B$$

Where;

I_{out} is the value of the intensity of a pixel of the equalized area ,
 I_{out} can range between Upper and Lower Limits of 255 and 0, respectively,

I_m is the value of the intensity of an associated pixel of the product application area of the base image (before equalization),
 I_m can range between the Upper and Lower Limits,

A is the slope of the function and is computed according to a gaussian distribution function, as follows:

$$A = \exp(-0.5 * (I_{color} - I_{mean})^2 / I_{stdev}^2)$$

Where,

I_{color} is the value of the intensity of the applied product color,

I_{mean} is mean value of the intensities of the pixels in the product application area, and

I_{stdev} is the variance of the intensities of the pixels in the product application area,

B is a constant computed by equating the I_m and I_{out} values in the equalization function to I_{mean} and I_{color} , respectively.

- blending pixels in said product application area of said product application area with said base image by modifying appearance information of said pixels of said blending region according to said alpha values

- a red color value (R_c) of said pixels of said product application area in said composite image being determined by the following formula:

$$R_c = [R_b * \text{Alpha} + R_p * (\text{Alpha} - \text{UpperLimit})] / \text{UpperLimit}$$

where

R_b is a red color value of an associated pixel in said base image

R_p is a red color value of said selected product;

Alpha is an Alpha value of an associated pixel in said product application

area; and

UpperLimit is a predefined upper limit of said Alpha values

a green color value (G_c) of said pixels of said product application area in said composite image being determined by the following formula:

$$G_c = [G_b * \text{Alpha} + G_p * (\text{Alpha} - \text{UpperLimit})] / \text{UpperLimit}$$

where

G_b is a green color value of an associated pixel in said base image

G_p is a green color value of said selected product;

Alpha is an Alpha value of an associated pixel in said product application

area; and

UpperLimit is a predefined upper limit of said Alpha values; and

a blue color value (B_c) of said pixels of said product application area in said composite image being determined by the following formula:

$$B_c = [B_b * \text{Alpha} + B_p * (\text{Alpha} - \text{UpperLimit})] / \text{UpperLimit}$$

where,

B_b is a blue color value of an associated pixel in said base image

B_p is a blue color value of said selected product;

Alpha is an Alpha value of an associated pixel in said product application

area; and

UpperLimit is a predefined upper limit of said Alpha values

- displaying a composite image of said base image as modified and blended in said product application area and said blending region thereof

- providing means to display an alternative product within said product application area

10. A method for simulating an appearance of accessories on an image of consumer, comprising

- compiling a database including an image of an accessory product and including an anchor point associated with said image of each said accessory product
- acquiring a base image of a consumer, said base image including a plurality of pixels
- defining an anchor point in said base image for location of an accessory product image
- calculating a base image size factor according to a pixel dimension of a body part of said consumer visible in said base image
- calculating a base image rotation factor according to an orientation of said body part in said base image
- receiving an accessory product selection from said consumer
- retrieving a product image from said database associated with said accessory product selection
- adjusting a size of said product image according to said base image size factor
- adjusting an orientation of said product image according to said base image rotation factor
- displaying a composite image of said base image with said product image superimposed thereover, said anchor point of said product image being substantially aligned with said anchor point of said base image
- providing means to allow said consumer to adjust the size or orientation of said product image
- adjusting said size or orientation of said product image and displaying an adjusted composite image in response receiving associated instructions from said consumer.

11. A method for simulating an appearance of accessories on an image of a consumer, as in claim 10 further comprising:

- assigning alpha values for certain pixels of said product image
- blending pixels of said product image having assigned alpha values with pixels of said base image according to said alpha values

12. A method for simulating an appearance of accessories on an image of a consumer, as in claim 11, further comprising:

- in said blending process, said alpha values resulting in certain areas of said product image being substantially fully transparent and certain areas of said product image being semi-transparent

13. A method of marketing aesthetic products, comprising:

- compiling a database of a plurality of aesthetic products, said database including appearance information for each said aesthetic product
- acquiring a base image of a consumer, said base image including a plurality of pixels
- identifying a product application area in said base image, said product application area including a blending region, said product application area and said blending region thereof being defined by sets of pixels of said base image
- selecting a product selection from said database
- retrieving appearance information associated with said selected product from said database
- modifying appearance information of said pixels of said product application area according to said appearance information of said selected product
- blending said product application area with said base image by modifying appearance information of said pixels of said blending region according to appearance information of said selected product and according to appearance information of associated pixels of said base image in said blending region
- distributing, to said consumer, a composite image of said base image as modified and blended in said product application area and said blending region thereof.

14. A method of marketing aesthetic products, as in claim 13 comprising:

- distributing a sample of said selected product with said composite image

15. A method of marketing aesthetic products, as in claim 13, further comprising:

- assigning alpha channel values to each pixel of said set of pixels of said product application area,
- blending said product application area with said base image by modifying

appearance characteristics of pixels of said product application area according to appearance information of said selected product and according to appearance information of associated pixels of said base image

- in said blending step, weighing said appearance information of said associated pixels of said base image and appearance information of said selected product according to alpha values of associated pixels of said product application area.

16. A method of marketing aesthetic products, as in claim 15, further comprising:

-in said blending step, weighing said appearance information of said associated pixels of said base image in reverse proportion to appearance information of said selected make-up product.

17. A method of marketing aesthetic products, as in claim 16 further comprising:

a red color value (Rc) of said pixels of said product application area in said composite image being determined by the following formula:

$$Rc = [Rb * Alpha + Rp * (Alpha - UpperLimit)] / UpperLimit$$
, where
Rb is a red color value of an associated pixel in said base image
Rp is a red color value of said selected product;
Alpha is an Alpha value of an associated pixel in said product application

area; and

UpperLimit is a predefined upper limit of said Alpha values

a green color value (Gc) of said pixels of said product application area in said composite image being determined by the following formula:

$$Gc = [Gb * Alpha + Gp * (Alpha - UpperLimit)] / UpperLimit$$
, where
Gb is a green color value of an associated pixel in said base image
Gp is a green color value of said selected product;
Alpha is an Alpha value of an associated pixel in said product application

area; and

UpperLimit is a predefined upper limit of said Alpha values; and

a blue color value (Bc) of said pixels of said product application area in said composite image being determined by the following formula:

$$Bc = [Bb * Alpha + Bp * (Alpha - UpperLimit)] / UpperLimit$$
, where
Bb is a blue color value of an associated pixel in said base image
Bp is a blue color value of said selected product;
Alpha is an Alpha value of an associated pixel in said product application

area; and

UpperLimit is a predefined upper limit of said Alpha values

18. A method of marketing aesthetic products, as in claim 13, wherein:

said step of modifying appearance characteristics of said pixels of said product application area further comprises

- assigning hue and saturation appearance values of said pixels of said product application area equal to hue and saturation appearance values of said selected product
- assigning intensity appearance values of said pixels of said product application area according to intensity appearance values of a plurality of pixels within said product application area in said base image and according to intensity appearance values of a plurality of pixels outside said product application area.

19. A method of marketing aesthetic products, as in claim 18, wherein:

- said step of assigning intensity appearance values of said pixels of said product application area further comprises employing the following formula:

$$I_{out} = A * I_{in} + B$$

Where;

I_{out} is the value of the intensity of a pixel of the equalized area ,
 I_{out} can range between Upper and Lower Limits of 255 and 0, respectively,

I_{in} is the value of the intensity of an associated pixel of the product application area of the base image (before equalization),
 I_{in} can range between the Upper and Lower Limits,

A is the slope of the function and is computed according to a gaussian distribution function, as follows:

$$A = \exp(-0.5 * (I_{color} - I_{mean})^2 / I_{sdev}^2)$$

Where,

I_{color} is the value of the intensity of the applied product color,

I_{mean} is mean value of the intensities of the pixels in the product application area, and

I_{sdev} is the variance of the intensities of the pixels in the product application area,

B is a constant computed by equating the I_{in} and I_{out} values in the equalization function to I_{mean} and I_{color} , respectively.

20. A method of marketing aesthetic products, as in claim 18, wherein:

said step of assigning intensity appearance values of said pixels of said product application area further comprises assigning intensity appearance values of said pixels of said product application area according to intensity appearance values of substantially all of said pixels in said base image.

21. A method of marketing aesthetic products, as in claim 20, wherein:

- said step of assigning intensity appearance values of said pixels of said product application area further comprises employing the following formula:

$$I_{out} = A * I_m + B$$

Where;

I_{out} is the value of the intensity of a pixel of the equalized area ,
 I_{out} can range between Upper and Lower Limits of 255 and 0, respectively,

I_m is the value of the intensity of an associated pixel of the product application area of the base image (before equalization),
 I_m can range between the Upper and Lower Limits,

A is the slope of the function and is computed according to a gaussian distribution function, as follows:

$$A = \exp(-0.5 * (I_{color} - I_{mean})^2 / I_{std}^2)$$

Where,

I_{color} is the value of the intensity of the applied product color,

I_{mean} is mean value of the intensities of the pixels in the product application area, and

I_{std} is the variance of the intensities of the pixels in the product application area,

B is a constant computed by equating the I_m and I_{out} values in the equalization function to I_{mean} and I_{color} , respectively.

22. A method for simulating an appearance of products on an image of a consumer as in claim 1, further comprising:

interconnecting first and second user systems through a network;

receiving a product selection from a first user;

displaying a composite image incorporating said product selected by said first user on said first and second user systems.

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